CALLISTO status report #4 of 2003-10-27

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FPU (focal plane unit)
Not applicable

RCU (receiver control unit)
Not applicable

RX (receiver)
Not applicable

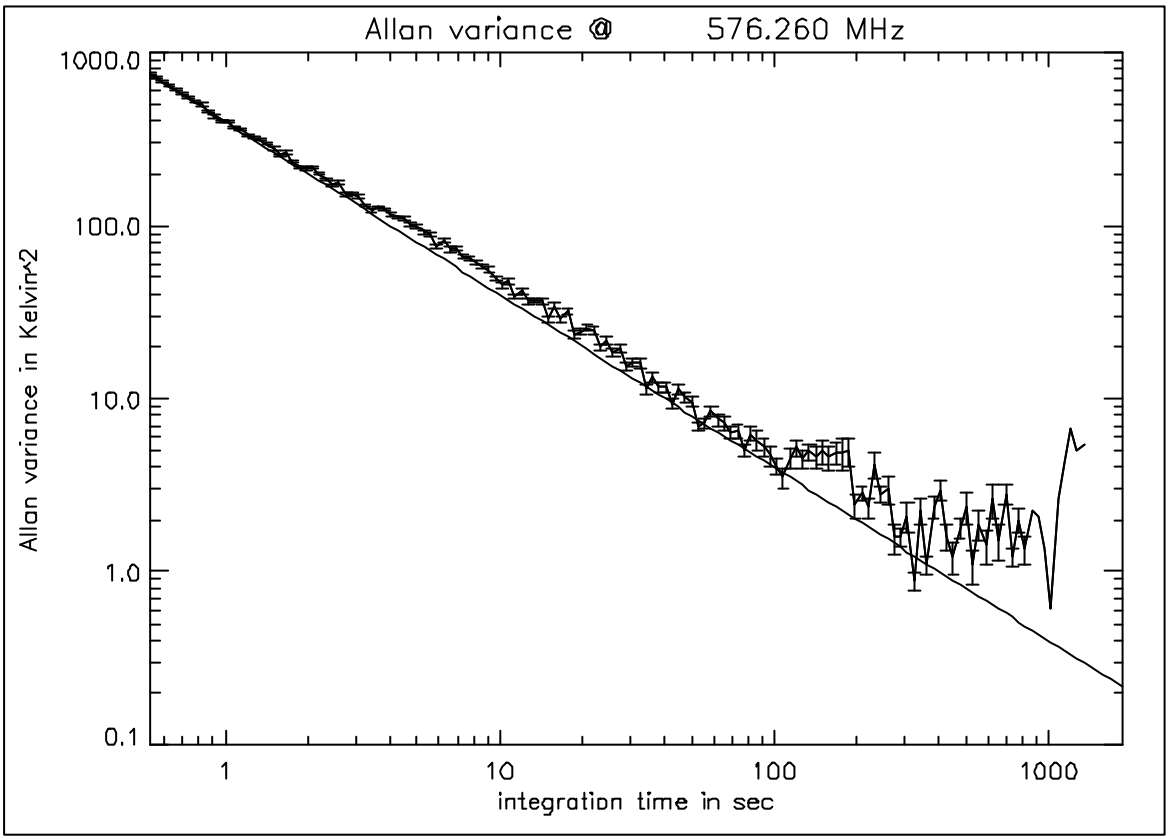
Host, Server
Not applicable

FM (flight model)
Manufacturing of two additional spectrometers is still running at the apprentice division of ETH. Delivery of metal boxes was unfortunately delayed but they are available now. Wiring/cabling is almost finished and communication was already tested successfully. One RISC-processor and some environmental sensors are missing but will be supplied within this week. A new, engraved front- and back panel will be supplied to upgrade the QM.

Calibration/FITS
A preliminary version of a FITS-reader is available (IDL routine coded by Peter Messmer). Some problems (missing digits) concerning the statistical distribution of the noise values have to be investigated. Therefore an old PHOENIX-2 reader (IDL) was modified just to read and analyze raw-files from Callisto spectrometer.

Tests/Qualification
CALLISTO QM was again tested at Bleien observatory. The radio spectrum is rather noisy due to a nearby ERMES- and TELE-paging system near 147MHz. Depending on pointing angle of the telescope rather strong radio frequency interferences took place.

Andreas Knecht - among other tests- measured the spectrometer-ALLEN-variance using To at our 7m parabola, see figure below. The temperature of the preamplifier in the FPU was kept constant to 300K+-1K using Peltier elements.



ECR (engineering change requests)

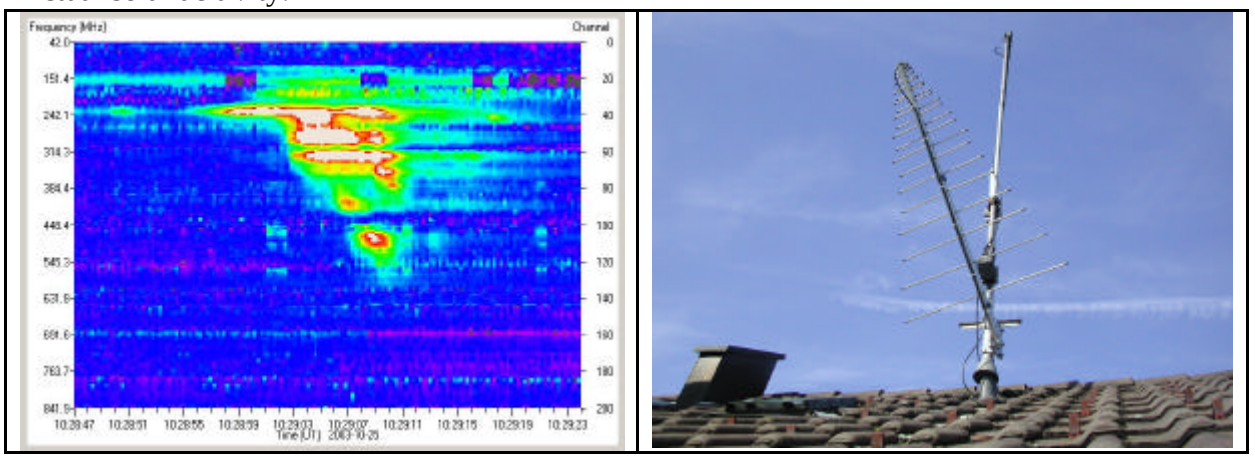
Commands list was upgraded by the new command 'O=observation mode' which selects the hardware– and software-configuration (PHOENIX-like or Green Bank-like). The structure of internal data stream was improved by introducing a start byte 'STX' and an end identifier 'EOT'. This makes it simpler and more reliable to distinguish between ordinary messages and real data. Messages are stored in the logfile, while all data are stored in a raw-file. Another control byte 'ACK' was introduced to improve upload-time of frequency programs into the external eeprom of the RISC processor. Possible buffer overflows where identified and solved using a more serious pointer handling. The observation mode has also to be stored in the header of the raw-file using field number 43 of the raw file header.. Existing measurement mode (PHOENIX-2: 0…7) was expanded to describe antenna calibration sources. Since the 'calibrator' needs to know which source was measured and stored in the raw-files (e.g. hot sun, cold sky, forest etc.), additional codes from 8 to 9 and from A…Z are now reserved. All codes are described in the actual version of the document "statementofworkV1.7.doc", available under: http://www.astro.phys.ethz.ch/instrument/callisto/Appdocs/applicabledocs.htm

AOB

All status reports are now available via URL (see bottom of the page): http://www.astro.phys.ethz.ch/instrument/callisto/Appdocs/applicabledocs.htm

We incidentally got a very new network converter (RS232, RS422, RS485) for evaluation tests for the coming two weeks. Our preliminary tests have shown that it is possible to control not only a Callisto spectrometer but also the attached FPU via network or probably even via internet. Instead of putting a noisy PC next to the spectrometer using RS232 connections, it seems feasible to remote control the whole system via network. Of course the question is: "Which solution produces less spurious signals"? Much more tests (sky temperature, ALLEN-variance etc. is needed to find the final answer…
Not all software is really ready, we have still some troubles with the scheduler in the host application. Since Win2000/XP is not a real-time system, we are still dealing with the quality of the scheduled observations. Manual control on the other hand is operating quite well. This week we have solved 10 of 17 NCR's (non conformance reports) and 7 of 22 open issues are also done. During our tests some new open issues and some new NCR may appear but we made good progress in the last few days. The most annoying detail was missing write rights on our work stations thus some compilers had heavy problems in saving their internal notes.

Actual solar acitivity:



A bright solar flare from last Saturday was captured with my home test setup (1 CALLISTO receiver connected to a standard PC). Although the antenna on top of the roof (see above right) is only an amateur log-per, the signal/noise is rather good due to strong flux values (200sfu at 203MHz and 5400sfu at 410MHz according to http://www.sec.noaa.gov/ftpdir/indices/events/20031025events.txt).